

Exploring the Unknowns

BY JAMES BRODRICK

In March, the U.S. Department of Energy (DOE) joined with the International Association of Lighting Designers (IALD) and the Illuminating Engineering Society of North America (IES) to host the Lighting Designer Roundtable on Solid-State Lighting. The focus of the gathering was to solicit designer input on solid-state lighting market and technology issues, and to encourage a discussion of the designers' experiences, ideas and recommendations regarding solid-state lighting and the LED industry.

It was clear that the lighting designers who gathered for the roundtable *are* using LEDs in select applications where their compact size, color-changing ability, long life and vibration resistance are useful. But much of our conversation centered on the "unknowns" related to solid-state lighting.

If a product lasts 50,000 hours, how do their customers know when to replace it, considering the LED product will continue to work (but provide lower light output) long after other lamp types would have burned out? What about color shift over time? What is being done to look at the environmental impact of solid-state lighting, to avoid issues like the mercury content in CFLs? The designers talked about the uncertainties related to new products and new players in the solid-state lighting industry. If a designer specifies a solid-state lighting prod-

uct and it fails, will the company still be there to back it up? What happens to warranties if a company is bought? One designer noted that it feels like they are buying a company rather than a product right now.

WANTS AND NEEDS

At the roundtable, IALD president Jeff Miller kicked off the discussion with valuable perspective on the role of solid-state lighting in a designer's palette. Attendees talked

It was clear that the lighting designers who gathered for the roundtable *are* using LEDs in select applications. But much of our conversation centered on the 'unknowns' related to solid-state lighting

about how uncertainties regarding lifetime, light output, color constancy, cost and operating conditions impact a designer's thinking.

A key concern among participants was the need for standards to enable meaningful product comparisons. Designers want to be able to easily compare products in their toolbox, to identify the right lighting solution for a particular application. New standards such as ANSI C78.377 on chromaticity and test methods like IES LM-79 and LM-80 on photometric output and lumen depreciation will help to advance the use of solid-state lighting solu-

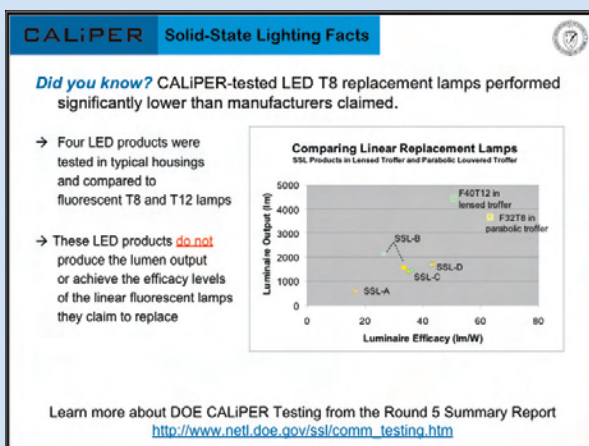
tions by enabling designers to compare new LED products with standard technologies in a meaningful way. Standards development organizations are continuing to produce additional important documents to cover LED drivers, reliability and luminaire testing.

TRUTH IN ADVERTISING

Another key concern is misinformation on solid-state lighting and false claims. Designers want to see more standardized reporting and cut sheets, with appropriate performance and application information, as well as some form of quality certification. Attendees discussed the

need for a standardized form—like a nutritional guide—that provides essential product information in a simple, consistent fashion.

The DOE CALiPER test program provides unbiased product performance information on commercially available solid-state lighting products, as well as useful benchmark data on comparable conventional lighting products. Round 5 CALiPER results were released in May; the Round 5 Summary Report and detailed test results for downlights, linear replacement lamps, A-Lamp and MR16 replacement lamps, desk/task lamps, undercabi-



net lighting and outdoor lighting are available via the DOE website at www.netl.doe.gov/ssl/comm_testing.htm. Round 6 results are expected later this month.

CALiPER test results have prompted greater industry understanding and awareness of product performance and reporting practices, and help to discourage market introduc-

tion of low-quality products. The arrival of the first solid-state lighting products with the Energy Star label this fall is another step to identifying high-performance products and enabling meaningful product comparisons.

In addition, a joint DOE-industry task group is working on a Solid-State Lighting Product Quality initiative, designed to forge greater consistency in industry reporting practices. Key components of the initiative include a guide for *Reporting LED Luminaire Product Performance*, a voluntary SSL Quality Pledge for manufacturers and end users, and a standardized product quality label for solid-

state lighting luminaires. This initiative was launched at the DOE SSL Market Introduction Workshop in July; learn more at www.netl.doe.gov/ssl.

DESIGNING WITH LEDs

At the roundtable, IALD member Samantha LaFleur from Atelier Ten and Eric Richman of Pacific Northwest National Laboratory provided an overview of a draft design guide developed by DOE and IES, *Lighting Design with LEDs*. The guide features technical information on LED performance, special characteristics and application challenges, and provides design guidance on specific applications according to space and building types. The guide examines LED performance in terms of absolute vs. relative photometry, performance standards, light output, color quality, CCT, CRI and color compatibility, as well as thermal management, product life and energy efficiency. Input from roundtable participants is being incorporated into the final draft of the guide, which goes to IES in the summer for final review and publication later this year.

Some of the questions raised by roundtable participants simply cannot be answered with the information available today. For example, the lack of long-term test data makes estimating useful life of LED products difficult. Also, it is unknown whether industry will move toward standard mechanical interfaces between LED “lamps” and fixtures, and that answer won’t be known for some time.

Other questions can be answered

more readily. For example, DOE is beginning a study on environmental impacts of solid-state lighting, drawing on industry-supplied data to assess the energy and environmental aspects of the manufacture, use and disposal/recycling of SSL systems. DOE is also recruiting lighting designers to join the manufacturers and host organizations involved in DOE Gateway demonstrations. Gateway demonstrations collect data on LED product performance and cost effectiveness in real-life installations; a lighting designer on the project team will augment the data collection with valuable assessment of the quality of light.

We hope the Chicago roundtable is the first of many dialogues with the lighting design community, and we seek your continued input on DOE testing, demonstrations and other program activities. To learn more or to download the Lighting Designer Roundtable report, visit www.netl.doe.gov/ssl.



James Brodrick is the lighting program manager for the U.S. Department of Energy, Building Technologies Program. The Department’s national strategy to guide high-efficiency, high-performance solid-state lighting products from laboratory to market draws on key partnerships with the lighting industry, research community, standards organizations, energy efficiency programs, utilities and many other voices for efficiency.



e-mail a letter to the editor:
ptarricone@ies.org